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**FACSIMILE TRANSMISSION COVER SHEET**

DATE: June 27, 2003

TO: Examiner Therkorn, Ernest G.  
 Group Art Unit 1723  
 U.S. Patent and Trademark Office  
 P.O. Box 1450  
 Alexandria, VA 22313-1450


RE: U.S. Patent Application No. 09/944,064  
 Entitled: MATERIAL FOR CHROMATOGRAPHY  
 Our Ref.: 01048 (3600-297)


FROM: Luke A. Kilyk, Esq.

FAC. TEL. NO.: 1 (703) 872-9310

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: GAUDET, et al.

Application No.: 09/944,064

Filed: August 31, 2001

For: MATERIAL FOR CHROMATOGRAPHY

Group Art Unit: 1723

Examiner: THERKORN, Ernest G.

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**REQUEST FOR RECONSIDERATION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

June 27, 2003

Sir:

This Request for Reconsideration is in response to the Office Action dated March 28, 2003, for which the Examiner has set a three-month period for response, thus making the response due on or before June 28, 2003.

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### REMARKS

Reconsideration and continued examination of the above-identified application are respectfully requested.

At page 2 of the Office Action, the Examiner rejects claims 1-10, 12, 13, and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. (U.S. Patent No. 5,270,280) in view of Mimori et al. (U.S. Patent No. 5,476,989). The Examiner acknowledges that the claims of the present application are different from Ichikawa et al. in as much as the claims recite the use of an organic group. Furthermore, the Examiner acknowledges that claims 12 and 13 of the present application differ from Ichikawa et al. in as much as the claims recite the temperature of less than 800° C. However, the Examiner asserts that Mimori et al. shows that the use of functional groups of a carbonized adsorbent allows selectivity. The Examiner further asserts that Mimori et al. shows that carbonizing at 500° C allows carbon to become hydrophilic. Therefore, the Examiner concludes that it would have been obvious to one skilled in the art to combine Ichikawa et al. and Mimori et al. to get the product of the claimed invention. For the following reasons, this rejection is respectfully traversed.

The claimed invention, in part, relates to a granulated product comprising carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein the granulated product has attached at least one organic group. Furthermore, the granulated carbonaceous product of the claimed invention as recited in claim 12, is produced, in part, by carbonizing the granules at a temperature of from about 400° C to less than 800° C.

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Ichikawa et al. relates to the use of carbon black packing materials for liquid chromatography, wherein the carbon blacks have specific dimensional ratios, specific particle diameters and surface areas, and specific micropore volumes. The methods of making the packing material according to Ichikawa et al. include granulating a carbon black-containing mixture and heat-treating the granules at a high temperature in the range of from 800 to about 3000° C, in an inert atmosphere. The high temperature heat-treatment is most likely necessary to carbonize and graphitize the binder material in order to form a graphitic layer. According to column 5, lines 60-68 and column 6, lines 38-41 of Ichikawa et al., if the temperature is below 800° C, the graphitization (carbonization) of the binder is not sufficient, resulting in the packing material having insufficient strength. Ichikawa et al., without any ambiguity, instructs one not to go below 800° C.

Mimori et al. relates to an adsorbent for the adsorption of radionuclides and to a process for the volume-reduction treatment of radioactive fuel that contains radionuclides. Mimori et al. simply does not relate to a packing material for liquid chromatography and method of manufacturing thereof. Mimori et al. is non-analogous art. Therefore, one skilled in the art would not combine Ichikawa et al. and Mimori et al. The only way the Examiner could possibly look to Mimori et al. is with the improper use of hindsight. Furthermore, as stated earlier, Ichikawa et al. specifically states that if the temperature is below 800° C, the carbonization of the binder is not sufficient; thus resulting in the packing material having insufficient strength. Moreover, the Examiner's references to column 4 of Mimori et al., and subjecting the active carbon to carbonization treatment at a temperature of from 500 to 1000° C needs to be explained. The Examiner attempts to argue that it would be obvious to use a lower temperature in Ichikawa et al. by relying on Mimori et al. However, the very paragraph relied upon by the Examiner,

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namely in column 4 of Mimori et al. is misinterpreted and misapplied to Ichikawa et al. First of all, to assist the Examiner, it is important for the Examiner to realize that claim 1 relates to a granulated product which comprises carbonaceous particles and at least one carbonized synthetic resin or carbonized pitch component or mixtures thereof. The granulated product also has attached at least one organic group. The carbonization treatment mentioned by the Examiner at column 4 of Mimori et al. relates to the carbonization of active carbon alone. There is no granulated product mentioned in Mimori et al., only a fibrous active carbon. Also, there is no carbonized synthetic resin or carbonized pitch component or mixtures thereof, Mimori et al. only mentions the carbonization treatment of the active carbon. This is very different from Ichikawa et al. which relates to a packing material which contains carbon black and a mixture of synthetic resin and other components. Thus, one skilled in the art could not possibly apply the carbonization treatment of fibrous active carbon to a completely different product in Ichikawa et al. The Examiner has not explained how one skilled in the art could do so especially in view of different products, different technologies, and different uses.

Furthermore, with respect to the Examiner's reliance on Mimori et al. for an attached organic group, as mentioned above, first, Mimori et al. is not combinable with Ichikawa et al. for the reasons described above. Second, the granulated product of the claimed invention has attached at least one organic group. Mimori et al. does not show a granulated product nor an organic group attached to any granulated product. Thus, again Mimori et al. alone or even combined with Ichikawa et al., if this possible, does not teach or suggest the claimed invention.

Accordingly, Ichikawa et al. teaches away from Mimori et al. by stating that at temperatures below 800° C, carbonization of the binder is not sufficient, resulting in the packing material having insufficient strength. One skilled in the art would not conclude that at temperatures below 800° C

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the packing material would have sufficient strength. There is no way Mimori et al. could modify Ichikawa et al. in view of the different technologies. Further, the lower temperatures of Mimori et al. were not concerned with making packing material for liquid chromatography. Thus, one would not alter the clear and strict guidance set forth in Ichikawa et al.

Therefore, even the combination of Ichikawa et al. and Mimori et al. does not teach or suggest the claimed invention. Accordingly, the rejection under 35 U.S.C. §103(a) over Ichikawa et al. and Mimori et al. should be withdrawn.

At page 3 of the Office Action, the Examiner rejects claims 1-10 and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the abstract of JP 2193066 or Holmes et al. (WO 95/01838) and Mikes et al., Laboratory Handbook of Chromatographic and Allied Methods, pages 218-224 and 385-391. The Examiner acknowledges that Ichikawa et al. does not teach or suggest attaching at least one organic group to the granulated product. However, the Examiner asserts that the abstract of JP 2193066 shows binding functional groups to carbon particles and Holmes et al. shows that binding functional groups to carbon chromatography material enhances the selectivity of the adsorbent. Furthermore, the Examiner asserts that Mikes et al. shows that affinant/functional groups are added to selectively adsorb substances. Therefore, the Examiner concludes that Ichikawa et al. in view of JP 2193066 or Holmes et al. and Mikes et al. teaches the claimed invention. For the following reasons, this rejection is respectfully traversed.

The arguments set forth above with respect to Ichikawa et al. apply equally here.

Also, it is the undersigned's understanding that the PTO has recently instructed Examiners not to rely on abstracts of references but to rely on a complete English translation of the document. For this reason alone, this rejection may not be appropriate. Further, JP 2193066 relates to a particulate activated charcoal which is anisotropic and produced from particles with a particle size

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of less than 80  $\mu\text{m}$  in more than 90% of the total while composed of micropores with a diameter of less than 20 angstroms in more than 85% of the total capacity. JP 2193066 simply does not teach or suggest carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, and mixtures thereof, wherein the granulated product has directly attached at least one organic group. The Examiner has provided no reasons why one skilled in the art would use the activated charcoal of this Japanese reference in Ichikawa et al. Furthermore, Ichikawa et al. uses carbon black and the Examiner has provided no reasons why one skilled in the art would easily substitute activated charcoal for carbon black. There is a clear difference between the two materials as recognized by those skilled in the art. No consideration has been provided on whether the particulate activated charcoal of the Japanese reference would sustain the processing steps of Ichikawa et al. including the high temperature of 800° C or more. Furthermore, the reference to functional groups in the abstract is not clear. There is no teaching or suggestion that any functional groups are attached to the activated charcoal. Furthermore, as explained above with respect to the earlier rejection, the present application, in claim 1, states that the organic group is attached to the granulated product. This is clearly not shown in the Japanese reference, since the Japanese reference does not relate to any granulated product such as recited in claim 1 of the present application.

Holmes et al. relates to a method for producing modified activated carbon materials wherein a nucleophilic agent is reacted with a halogenated carbon to result in an activated carbon having an associated moiety such as an amino, thiol sulphonic or other sulfur oxide, halogen, carboxy, keto, aldehyde, or heterocyclic ring group associated with the carbon. Page 3, lines 4-15, of Holmes et al. states that the precise nature of the association of the agent with the activated carbon, and displacement of halogen, has not yet been elucidated and that it is uncertain whether

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any halogen is retained as a salt with the nucleophilic agent or whether it is lost under vacuum. As with the other secondary references, Holmes et al. relates to an activated carbon material. As one skilled in the art knows, activated carbon is not the same as carbon black as used in Ichikawa et al. Again, one skilled in the art would not readily substitute activated carbon for carbon black since the two materials are quite different from each other with respect to properties and the manner in which they are made. Thus, Holmes et al. is not combinable with Ichikawa et al. just as the Japanese reference described above is not combinable with Ichikawa et al. Furthermore, any functional groups which are involved with the activated carbon of Holmes et al. is still different from a granulated product having an attached organic group as recited in claim 1. Regardless of the interaction or association, Holmes et al. fails to teach or suggest a modified carbonaceous adsorbent composition wherein an organic group is attached to the granulated product, as set forth in the claimed invention.

Mikes et al., in general, relates to ion exchange chromatography and affinity chromatography. Mikes et al. does not teach or suggest any carbonaceous material. Furthermore, the ionic exchange referred to in Mikes et al. does not seem to mention or even suggest carbon black like that used in Ichikawa et al. It is the applicants' understanding that carbon black is not considered an ionic exchanger. Thus, again like the other secondary references, Mikes et al. would not even be combinable with Ichikawa et al. since Ichikawa et al. relates to a material which includes carbon black and not "ionic exchangers" as used in Mikes et al.. Furthermore, there is no motivation to make such a substitution when Ichikawa et al. does not suggest other materials and Mikes et al. does not teach or suggest using such ionic exchangers in the type of material set forth in Ichikawa et al. In addition, Mikes et al. may describe functional groups but not attached to a granulated product such as described in claim 1



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of the present application. Therefore, Mikes et al. does not teach or suggest granulated products having carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein the granulated product has directly attached at least one organic group. In sum, the combination of the references does not teach or suggest a granulated product having carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein the granulated product has at least one organic group. Accordingly, the rejection under 35 U.S.C. §103(a) over Ichikawa et al., JP 2193066 or Holmes et al., and Mikes et al. should be withdrawn.

At page 4 of the Office Action, the Examiner rejects claims 12 and 13 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the abstract of JP 2193066 or Holmes et al., and Mikes et al. as applied to claims 1-10 and 36 above, and further in view of either Mimori et al. or the abstract of JP 54041296. The Examiner acknowledges that the claims of the present application differ from Ichikawa et al. in view of either the abstract of JP 2193066 or Holmes et al. and Mikes et al., in as much as the claims recite the use of a temperature of less than 800° C. However, the Examiner asserts that Mimori et al. shows that carbonizing at 500° C allows carbon to become hydrophilic. Furthermore, the Examiner asserts that the abstract of JP 54041296 shows that heating carbon black and a carbonizable binder at 500° C forms a support useful for adsorption. Accordingly, the Examiner concludes that it would have been obvious to use a temperature of less than 800° C in Ichikawa et al. in view of either the abstract of JP 2193066 or Holmes et al. and Mikes et al. For the following reasons, this rejection is respectfully traversed.

The arguments set forth above with respect to Ichikawa et al., JP 2193066, Holmes et al., Mikes et al., and Mimori et al. apply equally here.

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The abstract of JP 54041296 shows granulating carbon black into spheres and dipping the spheres in a solution of a carbonizable binder such as phenol formaldehyde resin, in a solvent such as acetone, showing a carbonization yield of more than 10% by calcination under an inert atmosphere at 500-1200° C. Ichikawa et al. teaches away from this reference by stating that carbonization below 800° C is not sufficient and will result in a packing material having insufficient strength. Therefore, one skilled in the art would not look to JP 54041296 when reading Ichikawa et al. Even if one skilled in the art looked to this Japanese reference, one would not modify Ichikawa et al. since Ichikawa et al. gives very strict instructions not to go below 800° C with respect to the type of product set forth in Ichikawa et al. Also, it is respectfully pointed out that unlike Ichikawa et al., this Japanese reference simply coats a granulated carbon black with a particular resin. Ichikawa et al. on the other hand specifically mixes carbon black with a synthetic resin to form a mixture which is then subjected to the remaining processing steps of Ichikawa et al. Thus, the Examiner's attempt to argue that it would be easy to use the temperatures of this Japanese reference in Ichikawa et al. has not taken into account the major differences between the products of the Japanese reference and Ichikawa et al. This taken into account and with the strict warnings provided by Ichikawa et al., one skilled in the art could not possibly combine this Japanese reference with Ichikawa et al. and the other secondary references. Furthermore, the combination of the references does not teach or suggest at least one organic group being attached to the granulated product. As stated above, the combination of references are not combinable, and even if combinable, do not teach or suggest the claimed invention. Furthermore, the comments above with respect to the PTO relying on abstracts would apply to the use of this JP abstract as well. Additionally, claims 12 and 13 are dependent directly on claim 1. Therefore, the reasons set forth above with respect to the

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patentability of claim 1, would apply equally here. Accordingly, the rejection under 35 U.S.C. §103(a) over Ichikawa et al., JP 2193066, Holmes et al., Mikes et al., Mimori et al., and JP 54041296 should be withdrawn.

At page 4 of the Office Action, the Examiner rejects claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Mimori et al. as applied to claims 1-10, 12, 13, and 36 above, and further in view of Dias et al. (U.S. Patent No. 4,619,805). The Examiner acknowledges that the claimed invention differs from Ichikawa et al. in view of Mimori et al. in as much as the claims recite the use of aqueous solvent. However, the Examiner asserts that Dias et al. shows that use of water allows carbon particles to be coated with binders and is used with phenolic resin. Accordingly, the Examiner concludes that it would have been obvious to use water in Ichikawa et al. in view of Mimori et al. For the following reasons, this rejection is respectfully traversed.

The comments above with respect to Ichikawa et al. and Mimori et al. apply equally here and are incorporated in their entirety by reference herein. Dias et al. does not overcome the serious deficiencies with respect to these two references as described above. For this reason alone, the rejection should be withdrawn.

Further, Dias et al. relates to a method of producing porous carbon bodies of high permeability. According to column 2 of Dias et al., carbon particles are suspended in a first liquid in which, after the suspension is made, a binder is wholly or partially dissolved. The first liquid and its dissolved and suspended substances are then introduced into a second liquid which is miscible with the first, but in which the binder is either insoluble or soluble only with difficulty. The suspended carbon particles are coated with the binder, settle, and form a muddy mass, which is then freed of supernatant liquid and thereafter dried. Dias et al. does not relate to

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packing material for liquid chromatography. Therefore, one skilled in the art would not be motivated to look to Dias et al. to overcome the deficiencies of Ichikawa et al.

Furthermore, Ichikawa et al. for instance at column 5, specifically states that in order to homogenize the carbon black in the binder, it is necessary, in a preferred embodiment, to disperse them in a suitable dispersing agent which is a solvent having good wettability with either the carbon black and binder. This is the complete opposite of the teaching of Dias et al. which encourages one to suspend carbon particles and a binder in water. Clearly, the teachings of Dias et al. are the opposite of Ichikawa et al. and one skilled in the art would not combine the two teachings. Accordingly, the rejection under 35 U.S.C. §103(a) over Ichikawa et al. in view of Mimori et al. and Dias et al. should be withdrawn.

At page 5 of the Office Action, the Examiner rejects claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the abstract of JP 2193066 or Holmes et al., Mikes et al., and either Mimori et al. or the abstract of JP 54041296 as applied to claims 12 and 13 above, and further in view of Dias et al. The Examiner concludes that it would have been obvious to use water in Ichikawa et al. in view of either the abstract of JP 2193066 or Holmes et al., Mikes et al., and either Mimori et al. or the abstract of JP 54041296. For the following reasons, this rejection is respectfully traversed.

The arguments set forth above with respect to Ichikawa et al., the abstract of JP 2193066, Holmes et al., Mikes et al., Mimori et al., and the abstract of JP 54041296, and Dias et al. apply equally here. For the many reasons described above, one skilled in the art would not combine these references or even if combinable would not consider the claimed invention obvious. Accordingly, this rejection should be withdrawn.

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At page 6 of the Office Action, the Examiner rejects claims 41 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al. The Examiner asserts that Dias et al. discloses that the use of water allows carbon particles to be coated with binders and is used with phenolic resin. Therefore, the Examiner concludes that it would have been obvious to use water in Ichikawa et al. For the following reasons, this rejection is respectfully traversed.

The arguments set forth with respect to Ichikawa et al. and Dias et al. apply equally here. Accordingly, this rejection should be withdrawn.

At page 6 of the Office Action, the Examiner rejects claims 39, 40, 42, and 43 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al. as applied to claims 41 and 46 above, and further in view of Mimori et al. or the abstract of JP 54041296. The Examiner asserts that it would have been obvious to use a temperature of less than 800° C in Ichikawa et al. in view of Dias et al. because Mimori et al. shows carbonization at 500° C. For the following reasons, this rejection is respectfully traversed.

The arguments set forth above with respect to Ichikawa et al., Dias et al., Mimori et al., and the abstract of JP 54041296 apply equally here. Accordingly, this rejection should be withdrawn.

At page 7 of the Office Action, the Examiner asserts that the restriction requirement and elections of species are deemed proper and are made final. The Examiner also states that claims 11, 44, and 45 have been withdrawn as being drawn to non-elected species. In view of the above comments, all claims are allowable over the cited art. The Examiner should rejoin the non-elected species at this time and examine the withdrawn claims.

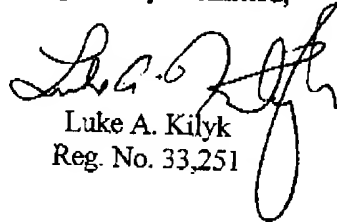
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### CONCLUSION

In view of the foregoing remarks, the applicants respectfully request the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,

  
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